

1. An Ethernet controller which processes packets received from a plurality of root complexes via a serial load/store fabric, the Ethernet controller comprising:
 - a bus interface coupled to the serial load/store fabric, said bus interface associating each of the packets with their root complex; and
 - control register logic, having a plurality of control registers, wherein each of said plurality of control registers is selectable to service at least one of the root complexes based on the association of the packets with their originating root complex.
2. The Ethernet controller as recited in claim 1 wherein the Ethernet controller is a 1 Gig Ethernet controller.
3. The Ethernet controller as recited in claim 1 wherein the Ethernet controller is a 10 Gig Ethernet controller.
4. The Ethernet controller as recited in claim 1 wherein the serial load/store fabric utilizes the PCI Express specification.
5. The Ethernet controller as recited in claim 1 wherein the serial load/store fabric is encapsulated within a second fabric.

6. The Ethernet controller as recited in claim 5 wherein said second fabric is a channel based fabric.
7. The Ethernet controller as recited in claim 6 wherein said second fabric comprises Advanced Switching.
8. The Ethernet controller as recited in claim 6 wherein said second fabric comprises All Ethernet.
9. The Ethernet controller as recited in claim 1 wherein the packets comprise:
 - a PCI Express transaction layer packet (TLP); and
 - a header, for associating said transaction layer packet with one of the root complexes.
10. The Ethernet controller as recited in claim 1 wherein the plurality of root complexes comprise a first computer executing a Microsoft Windows operating system.
11. The Ethernet controller as recited in claim 10 wherein said Microsoft Windows operating system is unaware that it is sharing the Ethernet controller with any other of the plurality of root complexes.
12. The Ethernet controller as recited in claim 10 wherein the plurality of root complexes further comprise a second computer executing a Linux operating system.

13. The Ethernet controller as recited in claim 12 wherein said Linux operating system is unaware that it is sharing the Ethernet controller with said first computer.
14. The Ethernet controller as recited in claim 1 wherein said bus interface comprises a table for associating each of said plurality of control registers with at least one of the plurality of root complexes.
15. The Ethernet controller as recited in claim 14 wherein said table is used to select one of said plurality of control registers to be used to process each of the packets received by the Ethernet controller.
16. The Ethernet controller as recited in claim 1 wherein said bus interface further comprises a multiplexer for selecting at least one of said plurality of control registers based on the associating performed by said bus interface.
17. The Ethernet controller as recited in claim 1 wherein each of said plurality of control registers comprise:

a set of dedicated control registers; and

a set of shared or aliased control registers.
18. The Ethernet controller as recited in claim 17 wherein said set of dedicated control registers are dedicated to a particular one of the plurality of root complexes.

19. The Ethernet controller as recited in claim 17 wherein said set of shared or aliased control registers, support the plurality of root complexes.
20. The Ethernet controller as recited in claim 1 further comprising:
 - a plurality of direct memory access (DMA) engines, each for handling packets from at least one of the plurality of root complexes; and
 - arbitration logic, coupled to said plurality of direct memory access engines, for arbitrating selection of said plurality of direct memory access engines used to process the packets received by the Ethernet controller from the plurality of root complexes.
21. The Ethernet controller as recited in claim 20 wherein said arbitration logic selects a particular one of said plurality of direct memory access engines for processing of packets received from more than one of the plurality of root complexes.
22. A shared network interface controller comprising:
 - a bus interface to a serial load/store fabric; and
 - a plurality of control registers selectable by said bus interface to be associated with packets from a plurality of root complexes.

23. The shared network interface controller as recited in claim 22 wherein said serial load/store fabric comprises PCI Express.
24. The shared network interface controller as recited in claim 22 wherein said serial load/store fabric comprises PCI Express plus header information to associate each of said packets with an associated one of said plurality of root complexes.
25. The shared network interface controller as recited in claim 24 wherein said bus interface is coupled to a shared I/O switch via said serial load/store fabric.
26. The shared network interface controller as recited in claim 25 wherein said shared I/O switch places said header information within said packets.
27. The shared network interface controller as recited in claim 22 wherein said bus interface comprises a lookup table for associating said plurality of control registers with said plurality of root complexes.
28. The shared network interface controller as recited in claim 27 wherein said bus interface further comprises a multiplexer for selecting the plurality of control registers utilizing information within said lookup table.
29. A shared data storage controller for accessing network data storage from a plurality of operating system domains (OSD's) via a common load/store link, the controller comprising:

a plurality of resources, each of which are allocated to a particular one of the plurality of OSD's; and

a bus interface, coupled to the common load/store link and said plurality of resources, for receiving packets from the plurality of OSD's and for selecting a particular one of the plurality of resources to be used for packet processing based on the allocation.

30. The shared data storage controller as recited in claim 29 wherein the shared data storage controller is a Fiber Channel controller.
31. The shared data storage controller as recited in claim 29 wherein the shared data storage controller is a serial ATA controller.
32. The shared data storage controller as recited in claim 29 wherein the shared data storage controller comprises a SCSI controller.
33. The shared data storage controller as recited in claim 29 wherein the shared data storage controller comprises a Serial Attached SCSI (SAS) controller.
34. The shared data storage controller as recited in claim 29 wherein the common load/store link is a PCI Express+ link.

35. The shared data storage controller as recited in claim 29 wherein a first one of said plurality of resources is allocated to a first one of the plurality of OSD's and a second one of said plurality of resources is allocated to a second one of the plurality of OSD's.
36. The shared data storage controller as recited in claim 29 wherein said plurality of resources comprise a plurality of control registers.
37. The shared data storage controller as recited in claim 25 wherein said packets comprise PCI Express packets plus header information which identifies which of the plurality of OSD's said packets originate from.
38. An apparatus to allow a first computer and a second computer to share an Ethernet network interface controller utilizing a serial load/store fabric, the apparatus comprising:
- a shared I/O switch;
 - a first link coupling the first computer to said shared I/O switch;
 - a second link coupling the second computer to said shared I/O switch;

a third link coupling said shared I/O switch to the Ethernet network interface controller, said third link utilizing the serial load/store fabric to pass packets originating from both the first computer and the second computer to the Ethernet network interface controller, said packets having header information which associates each of said packets with either the first computer or the second computer; and

an interface for the Ethernet network interface controller which examines said packets, including said header information, for selecting resources for said packets based on said association.

39. The apparatus as recited in claim 38 wherein the first computer is a blade server.
40. The apparatus as recited in claim 38 wherein the second computer is a blade server.
41. The apparatus as recited in claim 38 wherein the serial load/store fabric utilizes PCI Express.
42. The apparatus as recited in claim 38 wherein said first link and said second link utilize PCI Express.
43. The apparatus as recited in claim 38 wherein said shared I/O switch comprises routing control to add said header information to said packets received from the first computer and the second computer.

44. The apparatus as recited in claim 38 wherein said interface comprises a table which associates said dedicated resources with either the first computer or the second computer.
45. The apparatus as recited in claim 44 wherein said interface further comprises a multiplexer for selecting said dedicated resources utilizing information from said table.
46. The apparatus as recited in claim 38 wherein packets from both the first computer and the second computer reside within the Ethernet network interface controller at the same time.
47. A method to allow at least two root complexes to share an endpoint device within a serial load/store fabric, comprising:
- identifying packets from the at least two root complexes with header information to associate the packets with the at least two root complexes;
 - transmitting the packets from the at least two root complexes to the endpoint device;
 - at the endpoint device, examining the packets to determine which of the at least two root complexes that are associated with;
 - allocating resources for the packets based on the association; and

processing the packets according to said step of allocating.

48. The method to share an endpoint device as recited in claim 47 wherein each of the at least two root complexes are computers without dedicated endpoint devices.
49. The method to share an endpoint device as recited in claim 47 wherein the endpoint device is a shared network interface controller.
50. The method to share an endpoint device as recited in claim 47 wherein the endpoint device is a shared storage controller.
51. The method to share an endpoint device as recited in claim 50 wherein the shared storage controller is a Fiber Channel controller.
52. The method to share an endpoint device as recited in claim 47 wherein the serial load/store fabric utilizes PCI Express.
53. The method to share an endpoint device as recited in claim 47 wherein said step of identifying packets embeds a header field within each of the packets.
54. The method to share an endpoint device as recited in claim 53 wherein the header field associates each of the packets with their originating one of the at least two root complexes.

55. The method to share an endpoint device as recited in claim 47 wherein said step of transmitting comprises:

receiving the packets from the at least two root complexes into a switch via independent links;

incorporating the header information into the packets;
and

transmitting the packets from the switch to the endpoint device via a single link.

56. The method to share an endpoint device as recited in claim 47 wherein said step of examining is performed by a bus interface.

57. The method to share an endpoint device as recited in claim 47 wherein the bus interface comprises a table to associated the header information with the resources.

58. The method to share an endpoint device as recited in claim 47 wherein the resources comprise a plurality of control registers.

59. The method to share an endpoint device as recited in claim 58 wherein each of the plurality of control registers are dedicated to either of the at least two root complexes.